PB81-246431

Hazardous Waste Management System: General Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; and Hazardous Waste Permit Program

(U.S.) Environmental Protection Agency
Washington, DC

Jul 81

U.S. Department of Commerce
National Technical Information Service
NTIS

PB81-246431

BACKGROUND DOCUMENT NO. 8

HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL; STANDARDS APPLICABLE TO OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES; AND HAZARDOUS WASTE PERMIT PROGRAM (40 CFR 260, 264, and 122)

Permitting of Land Disposal Facilities: Ground-Water and Air-Emission Monitoring

This document (ms. 1941.41) provides background information on EPA's proposed regulations for land disposal of hazardous waste

U.S. ENVIRONMENTAL PROTECTION AGENCY
July 1981

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO.	2.	3. Recipient's Accession No. PB81 246431

4. Title and Subtitle
Hazardous Waste Management System: General; Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilties; and Hazardous Waste Permit Programs

5. Report Date
July 1981

6.

7. Author(s)
Office of Solid Waste EPA

8. Performing Organization Rept. No.
1941.33-.42

9. Performing Organization Name and Address
US Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
US Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

Provides background information used in developing performance standards for hazardous waste land disposal facilities. The standards were published in EPA's proposed regulations on February 5, 1981.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms
Permitting of Land Disposal Facilities

c. COSATI Field/Group

18. Availability Statement:	19. Security Class (This Report)	21. No. of Pages
	20. Security Class (This Page)	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

TABLE OF CONTENTS

INTRODUCTION		Page 3
I.	NEED FOR THE REGULATION (Ground-water Monitoring)	Page 4
II.	ANALYSIS OF THE REGULATION (Ground-water Monitoring)	Page 4
1.	Relationship to Interim Status Regulations	Page 4
2.	Applicability - §264.90	Page 8
3.	Ground-water monitoring system - §264.91	Page 11
4.	Sampling and analysis - §264.92	Page 15
5.	Preparation, evaluation, and response - §264.93	Page 18
6.	Recordkeeping and reporting - §264.94	Page 25
7.	Triannual reprediction of leachate plume migration - §122.28(f)	Page 26
8.	Modification or revocation and reissuance of permits - §122.15(a)(8)	Page 27
9.	Minor modification of permits - §122.17(a)(8)	Page 28
IV.	NEED FOR THE REGULATION (Air emission monitoring)	Page 29
V.	ANALYSIS OF THE REGULATION (Air emission monitoring)	Page 29
1.	Applicability - §264.90	Page 30
2.	Air emission monitoring system - §264.95	Page 30
3.	Air emission sampling and analysis - §264.96	Page 32
4.	Air emission evaluation and response - §264.97	Page 33
5.	Air emission recordkeeping and reporting - §264.98	Page 36

INTRODUCTION

This background document covers two distinct subjects; ground-water monitoring, and air emmission monitoring

Interim Status requirements for ground-water monitoring were promulgated on 19 May 1980. At the time of promulgation of the Part 265 interim status standards, a background document "Subpart F - Ground-water Monitoring" dated 2 May 1980 was prepared. The general status ground-water monitoring regulations are similar and were reproposed on 5 February 1981. Both interim status and general regulations for ground-water monitoring were originally proposed on 18 December 1978. The basis for reproposing the general regulations applicable to land disposal facilities, of which the ground-water monitoring regulations are a part, is discussed in the Section II of the preamble to the 5 February 1981 reproposal.

The air emission monitoring requirements have not been proposed previously. On 18 December 1978, the Agency did propose air emission standards for treatment and disposal of hazardous wastes at 43 FR 59008. Based on a number of comments and the Agency's own analysis, the Agency expressed concern about the proposal which included a definition of volatile waste solely in terms of its vapor pressure and used the OSHA levels as a basis for allowing variances. The Agency discussed some aspects of the comments and the reasons for such concern in the preamble to the Interim Status Standards under the heading "Volatile Waste" at 45 FR 33166 on 19 May 1980. The Agency is continuing its investigations of alternative techniques available to control the problem of hazardous air emissions from land disposal facilities.

These air emission monitoring requirements are being proposed as a means of evaluating and verifying the predictions of air emissions required as a function of permit issuance. The agency has prepared a "Land Disposal Toxic Air Emissions Evaluation Guideline" to describe and support procedures for assessing downwind impact. This guideline is referenced in paragraph 6 of the preamble to Subpart F at 46 FR 11141.

I. NEED FOR REGULATION (Ground-water monitoring)

The need for this regulation has been covered in the background document "Subpart F - Ground-water Monitoring" dated 2 May 1980.

II. ANALYSIS OF STANDARDS (Ground-water monitoring)

1. Relationship to Interim Status Regulations

A. Proposed Regulation and Rationale

A very similar set of requirements to those adopted for interim status are proposed in this regulation as applicable under general status. The requirements are revised to reflect the fact that the performance standard for each facility is to be individually determined and to be stipulated in the facility permit. This regulation provides that the monitoring objective for general status facilities be to determine permit compliance; it also provides for greater interaction between the owner or operator and the Agency.

B. Summary of Comments

The 2 May 1980 Background Document (page 12) included the statement "Comments related to permit award will be addressed in the background document for 40 CFR 264, Subpart F." After a re-evalutation of the comments on the 18 December 1978 proposed regulations, the agency found that all comments pertinent to the

general status regulations had been addressed in the 2 May 1980 Background Document.

C. Discussion

The general status requirements included in 40 CFR Part 264, specify the ground water monitoring procedures for land disposal facilities used to manage hazardous waste which have been awarded an operating permit under Section 3005 of the RCRA. These ground-water monitoring requirements are based upon, and whenever possible actually incorporate, the ground-water monitoring requirements for facilities operating under interim status; 40 CFR 265, Subpart F. The fundamental difference between the Subpart F requirements in Parts 264 and 265 is in the purpose of monitoring. As fully explained in the Part 265 Background Document, ground-water monitoring during interim status is intended to determine whether or not a facility is affecting ground-water quality as a result of a discharge from the facility. Once a discharge is detected, owners and operators are required to determine and report to the Regional Administrator the extent of the facility impact on ground-water quality and the rate of migration within the aquifer. The Part 264 requirements, to be explained in this Background Document, are intended to determine: (1) when a discharge from a land disposal facility has reached the ground water; (2) the quality of the affected ground water; and (3) the rate and direction of contaminated ground-water flow. Both Parts 264 and 265 require owners and operators to determine the impact on the ground-water quality which results from leachate discharge from the facility. The use of these determinations is, however, very different depending upon

whether the facility is operating under interim status or has received a RCRA operating permit.

During interim status the Regional Administrator reviews reported ground-water quality in order to determine first, whether the facility is having an effect on the ground-water quality, and second, whether the effect is significant in consideration of the type and proximity of ground-water users. Based on this review the Regional Administrator has several options available. Among these are: initiation of enforcement action under the imminent hazard provisions of Section 7003 of RCRA; notifying the owner or operator that he must, within six months, submit the Part B application for a RCRA facility operating permit; and allowing the facility to continue operation under interim status.

In contrast, a facility which is operating under a RCRA permit and reporting ground-water quality in accordance with Part 264 requirements is reviewed by the Regional Administrator for compliance with the ground-water protection provisions of the facility permit. Unlike facilities under interim status, at permitted facilities allowable ground-water effects have been determined in advance as part of the permit review and approval process. As explained in Background Document No. 7 Ground-Water Protection Standard, allowable ground-water effects are determined separately and individually for each facility seeking a RCRA operating permit in consideration of: the pre-site ground-water quality; the current and future ground-water users; the risk associated with current or future use of the affected ground water; and, the predicted quality of the ground water as it flows in aquifers away from the facility.

As explained in a later portion of this Background Document, the ground-water quality information obtained in accordance with Part 264 must also be used to verify predictions of plume migration and as input data in periodically required re-predictions.

Therefore, since a large portion of the Part 264 ground-water monitoring requirements are nearly identical to the Part 265 requirements, they are not discussed in this Background Document. The reader is referred to the Part 265 Subpart F Background Document, dated May 2, 1980, for those discussions. In this Background Document the differences from the Part 265 requirements are discussed and explained.

The proposed general status rule for ground-water monitoring is structured in manner identical to Part 265 as follows:

§264.90 Applicability

§264.91 Ground-water monitoring system

§264.92 Sampling and analysis

§264.93 Preparation, evaluation and response

§264.94 Recordkeeping and reporting

The proposal requires that owners or operators establish a monitoring program capable of determining permit compliance. Two ground-water monitoring schemes are available, depending on whether hazardous wastes or byproducts have entered the ground water. The the ground water monitoring program requirements includes up and down gradient wells, sampling and analysis, and well-by-well comparisons of current and background values. The proposed regulations provide for appropriate responses by the owner or operator to the results of these comparisons.

2. Applicability - §264.90

A. Proposed Regulation and Rationale

See the 2 May 1980 Background Document.

B. Summary of Comments

See the 2 May 1980 Background Document.

C. Discussion

The Part 265 ground-water monitoring requirements apply to facilities used to treat, store or dispose of hazardous waste including landfills, surface impoundments, and land treatment facilities. These proposed Part 264 requirements apply to all types of land disposal facilities. There has been a definitional change, however; facilities which are used solely to store or store and treat hazardous waste in surface impoundments or piles from which the waste and waste residues will be removed at closure need not comply with these proposed ground-water monitoring requirements. The purpose of monitoring in accordance with Part 264 is to determine compliance with the ground water protection requirements specified in the facility permit. The proposed regulations specify different monitoring performance depending upon the situation at the facility.

At new facilities, waste will not have been disposed of until after permit award and, therefore, discharges from the facility will not have occurred. At such facilities the initial monitoring of the ground water is to be performed in the same manner as specified in the part 265 regulations. That is, indicator parameters are to be monitored to establish background quality and to detect the entry of hazardous waste or decomposition byproducts into the ground water.

The Agency requires this indicator monitoring, as in Part 265, to lessen the analytical burden on owners and operators. There is no purpose to analyzing for a large number of chemical species which may be released from the facility until there is reason to believe that a facility discharge has reached the ground water. This indicator monitoring is also proposed to apply to facilities which, prior to permit issuance, were operating under interim status and monitoring the indicators in accordance with Part 265, but which had not detected a discharge to the ground water. At the remainder of the interim status facilities, where discharges to ground water have already been detected at the time of permit award, the ground-water quality monitoring requirement is proposed so as to determine the subsequent effect on ground-water quality from facility discharges. This information will be periodically compared with the allowable ground-water quality limits specified in the facility permit to determine compliance or violation and will further provide input in performing periodic re-predictions of ground-water quality in the aquifer downgradient from the facility. While this proposed ground-water quality monitoring requirement is very similar to the ground-water assessment program of Part 265, it is more rigorous. The results of the assessment program of Part 265 are reviewed by the Regional Administrator to determine appropriate action, such as imminent hazard enforcement or an order to file the Part B application for a permit. The proposed Part 264 monitoring is to determine the presence, migration and concentration of hazardous waste and any products of reaction or decomposition of the hazardous waste or

any other waste or medium, including the soil, with which in comes in contact. The Part 265 monitoring is focused on hazardous waste and hazardous waste constituents for which the waste was listed under Section 3001 of RCRA.

While the Part 265 ground-water monitoring regulations include a provision whereby an owner or operator can waive all or part of the monitoring requirements, based upon a low potential for migration (during the term of interim status) of hazardous waste into and with the ground water to water supply wells, no similar provision is included in the proposed Part 264 requirements. Any differences from or lessening of the Part 264 requirements will be specified in the facility permit, having been determined appropiate during the permit application review and approval process.

D. Regulatory Language

§264.90 Applicability.

(a) Except as otherwise provided in this chapter, the owner or operator of a land disposal facility as defined in §260.10 and listed in §264.19, which is used to manage hazardous waste must implement a ground-water monitoring program, capable of determining compliance with or violation of the ground-water quality provisions of the facility's permit, in accordance with the requirements of this Subpart. Ground-water monitoring is required during the active life of the facility, and if hazardous wastes or decomposition byproducts remain after closure, during the post-closure period as well.

(b) The owner or operator of a facility from which hazardous waste or decomposition byproducts have not entered the ground water must install, operate and maintain a ground-water monitoring system to detect any such entry which may occur.

(c) The owner or operator of a facility from which hazardous waste or decomposition byproducts have entered the ground water must install, operate and maintain a ground-water quality monitoring system to measure the effect of discharges from the facility on ground-water quality.

3. Ground-Water Monitoring System - §264.91

A. Proposed Regulation and Rationale

See the 2 May 1980 Background Document.

B. Summary of Comments

See the 2 May 1980 Background Document.

C. Discussion

For those permitted facilities monitoring the indicator parameters to detect facility discharges to ground water, the proposed Part 264 requirements are identical to the well locational requirements included in Part 265. The proposed Part 264 requirements include a provision, not included in Part 265, which authorizes use of a different monitoring well layout, other than upgradient and downgradient, at facilities where the geohydrology prevents compliance, such as location on a ground-water divide (e.g., hilltop or ridge location).

For permitted facilities where a discharge to ground water is already known to be occuring, the proposed Part 264 requirements specify that the monitoring system must be "capable of yielding

ground-water samples for analysis to provide sufficient ground-water quality data to perform the comparisons and evaluations" specified in another section of part 264, discussed below. The prescribed well layout for this ground-water monitoring program consists of one group of monitoring wells located at the downgradient edge of the waste management area and a second group of monitoring wells located at some distance downgradient from the waste management area. Two downgradient well groupings are required so that changes in the quality of the ground water can be measured as it flows through the aquifer away from the facility. The rate of flow of contaminated ground-water will also be directly measurable with this layout. Part 264 does not specify the minimum number or depths of the monitoring wells, since this will be facility specific and reflected in the facility permit. These proposed Part 264 requirements define, as does Part 265, the waste management area for both single and multi-unit facilities, and require monitoring of the waste management area, not each operational unit. The facility permit may, of course, require additional monitoring within a waste management area.

Well casing, screening, and sealing requirements are included in the proposed Part 264 regulations, as in the Part 265 regulations.

D. Regulatory Language

§264.91 Ground water monitoring system.

(a) A ground-water monitoring system, to detect the entry of hazardous waste or decomposition byproducts from the facility into ground water, must be capable of yielding ground-water samples for analysis and must consist of:

(1) Monitoring wells (at least one) installed hydaulically upgradient (i.e., in the direction of increasing static head) from the limit of the waste management area. Their number, locations, and depths must be sufficient to yield ground-water samples that are:

(i) Representative of background ground-water quality in the surficial aquifer underlying the facility; and

(ii) Not affected by the facility; and

(2) Monitoring wells (at least three) installed hydaulically downgradient (i.e., in the direction decreasing static head) at the limit of the waste management area. Their number, locations, and depths must enable the immediate detection of any statistically significant amounts of hazardous waste or decomposition byproducts that migrate from the waste management area to the surficial aquifer.

(b) If the monitoring system described in paragraph (a) of this section cannot be utilized because of an inability to satisfy well-locational requirements, then the owner or operator must install an alternate ground-water monitoring system capable of detecting the entry of any hazardous waste or decomposition byproducts into the ground water.

(c) A ground-water monitoring system to measure the effect of discharges from the facility on ground-water quality must be capable of yielding ground-water samples for analysis to provide sufficient ground-water quality data to perform the comparisons and evaluations required in accordance with §§264.93(f), (g), and (h) and must consist of:

(1) Monitoring wells installed hydraulically downgradient (i.e., in the direction decreasing static head) at the limit of the waste management area. Their number, locations, and depths must enable the detection and quantification of any hazardous waste or decomposition byproducts from the facility which have entered the ground water, and

(2) Monitoring wells installed hydraulically downgradient from the limit of the waste management area. Their number, locations, and depths must enable the detection and quantification of any hazardous waste or decomposition byproducts from the facility which have migrated via the ground water.

(d) Separate monitoring systems for each operational unit of a facility are not required provided that provisions for sampling upgradient and downgradient water quality enable detection and measurement of any discharge from the waste management area (i.e., the limit projected in the horizontal plane as it would exist at completion of the hazardous waste management activity).

(1) In the case of a facility consisting of only one land disposal operational unit, the waste management area is described by the waste boundary (perimeter).

(2) In the case of a facility consisting of more than one operational unit, the waste management area is described by an imaginary boundary line which circumscribes the several waste management operational units.

(e) All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated, and packed with gravel or

sand where necessary, to enable sample collection at depths where appropriate aquifer flow zones exist. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed with a suitable material (e.g., cement grout or bentonite slurry) to prevent contamination of samples and the ground water.

4. Sampling and Analysis - §264.92

A. Proposed Regulation and Rationale

See the 2 May 1980 Background Document.

B. Summary of Comments

See the 2 May 1980 Background Document.

C. Discussion

The proposed Part 264 requires, as does Part 265, that a ground-water sampling and analysis plan be developed and followed for each facility. For permitted facilities which are monitoring the indicator parameters the proposed Part 264 requirements identify the same indicator parameters as are specified in Part 265. In Part 264, however, other suitable indicators may be substituted or added as specified in the facility permit.

The proposed Part 264 requires that background concentrations for each indicator parameter be established for each monitoring well based on at least quarterly sampling for one year. In Part 265, background values for the indicator parameters are to be established based upon samples from the upgradient wells only. This was required based upon the assumption that upgradient ground water would not have been contaminated by the facility. However, downgradient ground water may or may not be contaminated by the

facility. The initial well comparisons against upgradient background ground water quality are required in Part 265 to address downgradient ground water contamination. Well by well comparisons are more informative when pre-facility background values are known but are not appropriate for interim status facilities. Facilities engaged in indicator parameter monitoring in accordance with the proposed Part 264 regulations, however, can not have affected downgradient ground water. For this reason, under Part 264, the Agency has required that background values be established for each monitoring well in the system and that all subsequent comparisons for indicator parameters be on a well by well basis. As in Part 265, four replicate measurements are required for each parameter at each well, and at least semi-annual sampling is required.

The proposed Part 264 regulations do not specify monitoring parameters or frequency for facilities monitoring the quality of affected ground water. They simply require that the monitoring must yield the information specified in the facility permit and that it provide sufficient basis for ground-water quality and plume migration re-predictions. Required parameters and monitoring frequency will be specified in the facility permit.

In Part 265, measurement of the elevation of the ground water surface is required at each sampling event. This same requirement is included in these proposed Part 264 regulations. In addition the proposed requirements specify that for large seasonal fluctuations (greater than 5 feet) in the water table elevation, or a substantial variation (greater than 2 feet) in the relative ground-water elevations between any two wells, the measurements be taken monthly.

D. Regulatory Language

§264.92 Sampling and analysis.

(a) The owner or operator must obtain and analyze samples from the installed ground-water monitoring system. The owner or operator must develop and follow a ground-water sampling and analysis plan. He must keep this plan at the facility. The plan must include procedures and techniques for:

(1) Sample collection;

(2) Sample preservation and shipment;

(3) Analytical procedures; and

(4) Chain of custody control.

(b) The owner or operator with a ground-water monitoring system installed to comply with the requirements of §264.91(a) must:

(1) determine the concentration or value of the following or other suitable parameters, used as indicators of ground-water contamination, in ground-water samples obtained from monitoring wells in accordance with paragraphs (b)(2), (b)(3), and (b)(4) of this section:

(i) pH

(ii) Specific Conductance

(iii) Total Organic Carbon

(iv) Total Organic Halogen

(2) For each monitoring well, establish initial background concentrations or values of the indicator parameters specified in paragraph (b)(1) of this section, based on at least quarterly sampling for one year.

(3) For each of the indicator parameters specified in paragraph (b)(1) of this section, obtain at least four replicate measurements for each sample and determine the initial background arithmetic mean and variance for each well by pooling the replicate measurements for the respective parameter concentrations or values in samples obtained from each well during the year.

(4) After the first year, all monitoring wells must be sampled and the samples analyzed at least semiannually.

(c) The owner or operator with a ground-water monitoring system installed to comply with the requirements of §264.91(c) must determine the concentrations of hazardous waste and decomposition byproducts in ground-water samples obtained with such frequency as necessary to enable the evaluations specified in §§264.93(f),(g), and (h).

(d) Elevation of the ground-water surface at each monitoring well must be measured each time a sample is obtained and, if such measurements show a seasonal variation in excess of five feet or a variation in the relative elevation of the ground-water between any two wells in excess of two feet, measured monthly. All ground-water elevation measurements will be recorded as a distance measurement from the reference elevation on the well head, and with respect to mean sea level based on USGS or USC&GS datum.

5. Preparation, evaluation and response - §264.93

A. Proposed Regulation and Rationale

See the 2 May 1980 Background Document.

B. Summary of Comments

See the 2 May 1980 Background Document.

C. Discussion

Proposed Part 264 adopts the Part 265 comparison requirements for facilities monitoring the indicator parameters with two minor differences. First, comparisons are to be made on a well by well basis, as explained in the previous section of this document. Second, the use of the Student's t-test for statistical comparisons is specified but the regulation also allows the use of other suitable statistical or quality control techniques for comparisons. The greater opportunity for owner-Agency dialogue in general status permit procedures allow Agency review and approval of specific schemes of monitoring which may be more appropriate to individual facilities.

For facilities monitoring ground-water quality, monitoring wells must be placed along the probable pathways for constituents and byproducts, and predicted ground-water quality must be compared with measured water quality in that pathway. While the owner or operator of an interim status facility need only be prepared with an outline of the assessment program these proposed requirements call for a complete monitoring plan.

The objective of the ground-water monitoring requirements for both interim status and general status is to provide prompt determinations of the entry, measurements of the rate and extent of migration, and measurements of the concentration of hazardous wastes and decomposition byproducts in ground water. The monitoring systems and plans established for a land disposal facility must be demonstrated to be capable of providing the sampling data needed for these purposes.

As discussed in the 2 May 1980 background document, the detection monitoring requirements establish a de-minimus monitoring system to provide a reasonably sure determination of whether or not a facility was in fact affecting the ground water due to the entry of discharge from the facility. In those cases where it is patently obvious that hazardous wastes or decompostion byproducts from the facility have entered the ground water, this screening process would be of little or no value.

For facilities on interim status, the Agency requires only an outline of a water quality assessment plan. The intent is to have the owner or operator prepared to develop and implement assessment monitoring upon detection of the entry of hazardous wastes or decomposition byproducts into the ground water. It is expected that detection monitoring will provide some specificity of the pathway and constituents of a discharge, which will assist the owner or operator in the development of the assessment plan. Developing the plan with detection monitoring experience and data available should allow the assessment plan to be better focused on the particular characteristics of discharges from the facility.

In Part 264, while the specification of a two step initiation of an assessment plan is deleted, the process will not be greatly different. The owner or operator of an existing facility already monitoring the ground water under interim status will have detection monitoring data available, and even if that monitoring has not shown entry, may have gained some additional understanding of the ground water flow system associated with his facility. However, the owner or operator of a new facility will have to develop his plan without

the information which might be gained from detection monitoring. The Agency intends that the ground water quality assessment plan, to be specified in the facility permit based on the monitoring plan proposed by the permit applicant, will be a phased plan. It is anticipated that data collection, analysis, and evaluation will be iteratively pursued. For example, the plan might specify that earth resistivity surveys will be conducted of a period of three months during initial facility operation, that the surveys will be analyzed, and that the information will be evaluated so as the determine the most appropriate sampling well locations. The Agency also expects that well installation, sampling, and analysis will be staged so that the first wells to be installed will be evaluated and provide additional data for decisions on other well locations.

There is also no expectation that the first submission of a ground water quality assessment plan must be a rigidly defined plan of events and actions. Provision is made to modify and improve the plan tri-annually in accordance with the requirements of §122.28(f). Therefore the initial submission of the plan, although it must be a commitment to a full scale monitoring system, can be focused on the near term initial monitoring and be less specific with respect to the future full scope of the ultimate monitoring system. The ultimate monitoring system will be better defined in conjunction with the tri-annual report required in §122.28(f) based on the experience and knowledge gained in the tri-annual re-predictions and monitoring of the development of the leachate plume.

The assessment plan, the tri-annual migration predictions, and the predicted quality vs. monitored quality data comparisons

are proposed in Part 264 as tools to check permit compliance. The system will provide both the Regional Administrator and the owner or operator of the facility with an early warning of any failure of the facility to perform in accordance with expectations. The ground-water quality assessment requirements are designed to measure the real impact of the facility on the environment. Based on the assessments, adjustments may be made to the facility or in the operation of the facility to assure permit compliance and to avoid adverse human health or environmental effects.

The product of the assessment plan, i.e., the assessments and tri-annual repredictions will be a basis for considering needed alterations to the permit for a facility. It will also be the basis upon which decisions may be made regarding the continuing acceptability of a discharge based on projected future permit compliance; and the need for public hearings in the event a permit modification is indicated.

Three errors in referencing other paragraphs of the regulations have been corrected in paragraphs (f) and (g) wherein §§264.92(c)(1) and (2) were referenced instead of §§264.91(c)(1) and (2).

D. Regulatory Language

§264.93 Preparation, evaluation, and response.

(a) The owner or operator with a ground-water monitoring system installed to comply with the requirements of §264.91(a) must have an approved plan for a ground-water contamination assessment program. The plan must describe a ground-water monitoring program capable of determining whether hazardous waste or decomposition byproducts from the facility have entered the ground water.

(b) For each well sampled in accordance with §264.92(b)(4), the owner or operator must calculate the arithmetic mean and variance, based on at least four replicate measurements on each sample, for each indicator parameter specified in §264.92(b)(1), and compare these results with the respective intitial background arithmetic means established in accordance with §264.92(b)(3). These comparisons must consider individually each of the wells in the monitoring system and must include:

(1) The Student's t-test at the 0.01 level of significance to determine statistically significant changes from initial background concentrations or values, or

(2) A suitable statistical comparison, other than the Student's t-test, or suitable quality control procedure (e.g., tolerance intervals) to determine unanticipated changes from initial background concentrations or values.

(c) If the comparisons made under paragraph (b) of this section for the upgradient wells show a significant change the owner or operator must:

(1) Determine whether the facility has caused the significant change,

(2) Determine whether the facility ground-water monitoring program must be modified to enable compliance with the requirements of §264.90(a) and (b),

(3) Notify in writing the Regional Administrator of his findings and of his proposed modifications to the facility ground-water monitoring program, and

(4) Reinstate the original or an approved ground-water monitoring program for the facility.

(d) If the comparisons made under paragraph (b) of this section show a significant increase (or pH decrease), the owner or operator must:

(1) Implement the plan for a ground-water contamination assessment program which meets the requirements of paragraph (a) of this section, and

(2) Determine, as soon as technically feasible, whether hazardous waste or decomposition byproducts from the facility have entered ground water.

(e)(1) If the determinations performed in accordance with paragraph (d)(2) of this section support a conclusion that no hazardous waste or decomposition byproducts from the facility have entered the ground water, the owner or operator must:

(i) Notify in writing the Regional Administrator of his findings and propose for approval any modifications to the facility ground-water monitoring program, and

(ii) Reinstate the original or an approved modified ground-water monitoring program for the facility.

(2) If the determinations performed in accordance with paragraph (d)(2) of this section support a conclusion that hazardous waste or decomposition byproducts from the facility have entered the ground water, the owner or operator must implement a ground-water monitoring program in accordance with §§264.90(a) and (c).

(f) The owner or operator with a ground-water monitoring system installed to comply with the requirements of §264.91(c) must predict

the anticipated reduction in the concentration of hazardous waste and decomposition byproducts in the ground water between monitoring wells specified in §264.91(c)(1) and those specified in §264.91(c)(2), initially and annually thereafter.

(g) At least annually the owner or operator must compare the quality of ground water samples obtained from the monitoring wells required in accordance with §264.91(c)(2) with the predicted quality in accordance with paragraph (f) of this section and include an analysis of this comparison with the annual report.

(h) The owner or operator must use the data generated by the ground-water quality monitoring program required in accordance with §§264.90(a) and (c), in preparing the tri-annual reprediction required in accordance with §122.28(f).

6. Recordkeeping and Reporting - §264.94

A. Proposed Regulation and Rationale

See the 2 May 1980 Background Document.

B. Summary of Comments

See the 2 May 1980 Background Document.

C. Discussion

The proposed requirements provide simply that the owner or operator must maintain records of all analyses and evaluations of ground-water quality and surface elevations required, and report annually to the Regional Administrator concerning the values, concentrations, comparisons and calculations which are required to evaluate facility performance.

D. Regulatory Language

§264.94 Recordkeeping and reporting.

(a) The owner or operator must keep records of all analyses and evaluations of ground-water quality and surface elevations required in accordance with this subpart.

(b) The owner or operator must report the following information to the Regional Administrator:

(1) The results of evaluations made in accordance with the requirements specified in §§264.93(c),(e).

(2) Annually: the concentrations or values determined in accordance with §§264.92(b),(c), and (d) along with the evaluations required under §§264.93(b) and (g). During the active life of the facility, this information must be submitted as part of the annual report required under §264.75.

7. Triannual reprediction of leachate plume migration - §122.28(f)

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11158

D. Regulatory Language

In §122.28, a new paragraph (f) is added to read as follows:

§122.28 Additional conditions applicable to all RCRA permits.

(f) The following report shall be submitted by the permittee to the Director on March 1 of the year following three full years of permitted operation, based on an October 1 through September 30

year (i.e., not a calander year) and tri-annually thereafter during the active life and post-closure period of the facility.

(1) A modified prediction prepared in accordance with the permit application requirements of §122.25(d); and

(2) Proposed modifications to the monitoring and (if necessary) modeling program describer in accordance with the permit application requirements of §122.25.

8. Modification or revocation and reissuance of permits - §122.15(a)(8)

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11151

D. Regulatory Language

In §122.15, paragraph (a)(8) is added to read as follows:

§122.15 Modification or revocation and reissuance of permits.

(a) * * *

(8) For RCRA only, based on the repredictions required in §122.28(f);

(i) When the repredictions indicate that the limits established in accordance with §§122.25(d)(3) and (4) have not or will not be met, the report required in §122.28(f) shall include a request for modification of the permit to:

(A) reduce the rate of waste disposal defined in accordance with 122.25(d)(1)(iii); or

(B) increase the zones of permitted effects defined in accordance with §§122.25(d)(3)(v) and (4)(iv).

(ii) the permittee may include in the report required in §122,28(f), a request for modification of the permit to reduce the zones of permitted effects.

(iii) if, in the opinion of the Director, the zones of permitted effects are substantially unrelated to actual zones of effects based on monitoring and modeling, the Director that the permittee redefine the zones to more closely reflect the actual zones of effects which exist and are predicted.

9. Minor modification of permits - §122.17(a)(8)

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11151

D. Regulatory Language

In §122.17, paragraph (e)(3) is added to read as follows:

§122.17 Minor modifications of permits.

(e) * * *

(3) Reduce the rate of waste disposal in accordance with §122.15(a)(8)(i) or decrease the zone of permitted effects in accordance with §§122.15(a)(8)(ii) or (iii).

IV. NEED FOR THE REGULATION (Air emission monitoring)

As noted in the introduction, these air emission monitoring requirements are being proposed to establish the means of evaluating and verifying the predictions of air emissions required as a function permit issuance. The need for control over air emissions from land disposal facilities is not at issue in this Subpart, and is established by reference to the summaries of damage cases arranged by type of facility which was the source (e.g., landfills, surface impoundments, etc.).

V. ANALYSIS OF THE REGULATION (Air emission monitoring)

Since the agency had not previously proposed air monitoring requirements and since the scope of the air monitoring requirements being proposed was based on predictions of air impact being verified; the agency prepared a document "Land Disposal Toxic Air Emissions Evaluation Guideline" to describe and support procedures for assessing downwind impact.

That document has been widely distributed and, together with the sections of the preamble noted below, serves as the primary background reference for the air emission monitoring requirements. The format of the regulatory provisions have been written to parallel the ground-water monitoring requirements. A minor supplement to the guidance document entitled "Collection of Publications on Techniques and Appartus for Ambient Air Sampling" has also been added to the docket record.

The guidance document is broader in scope than the air monitoring requirements and is concentrated on the types of predictive techniques which are available to evaluate air impacts.

A more complete analysis of the air monitoring requirements will be undertaken in conjunction with the promulgation of final air monitoring regulations after the agency has had the oppurtunity to review comments on the proposal.

1. Applicability - §264.90

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11141

D. Regulatory Language

§264.90 Applicability.

(d) The owner or operator of a facility from which hazardous waste or decomposition byproducts are emitted into the air must establish and operate an air monitoring program to measure the effect of the facility on ambient air quality, and the locations of gaseous release from below the surface of the ground or the surface of wastes placed into or on the land.

2. Air emission monitoring system - §264.95

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11141-42

D. Regulatory Language

§264.95 Air emission monitoring system.

(a) An air emission monitoring system to measure the effect of the facility on ambient air quality must be capable of yielding ambient air samples for analysis to provide sufficient ambient air quality data to perform the comparisons and evaluations required in accordance with §264.97(a), (b), and (c) and must consist of:

(1) Monitoring air samplers installed upwind at or beyond the limit of the waste management area to yield air samples that are:

(i) Representative of background ambient air quality in the atmosphere upwind of the facility, and

(ii) Not affected by the facility; and

(2) Monitoring air samplers installed downwind at or beyond the limit of the waste management area. Their number and locations must enable the detection and quantification of any hazardous constituents or decomposition byproducts from the facility which have been transported via atmospheric dispersion, and

(3) Wind direction and speed indicators to determine wind direction and speed. Their number and locations must enable the upwind and downwind use of monitoring air samplers installed in accordance with (a)(1) and (a)(2) of this section, and the evaluations required in accordance with §264.97(a), (b), (c), and (f).

(b) If the air monitoring system described in paragraph (a) of this section cannot be utilized because of an inability to satisfy locational requirements, then the owner or operator must install an alternate air emission monitoring system capable of providing sufficient quantity of ambient quality data equivalent

to the requirements of paragraph (a) of this Section.

(c) An air emission monitoring system, to detect the locations of a gaseous release must enable the immediate detection of the emissions of any hazardous constituents or decomposition byproducts which have migrated from the limit of the waste management area defined in §122.25(d)(3).

3. Air emission sampling and analysis - §264.96

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11142

D. Regulatory Language

§264.96 Air emission sampling and analysis.

(a) The owner or operator must obtain and analyze samples from the installed air emission monitoring system. The owner or operator must develop and follow an ambient air sampling and analysis plan. He must keep this plan at the facility. The plan must include procedures and techniques for:

(1) Sample collection;

(2) Sample preservation and shipment;

(3) Analytical procedures, including types of contaminant to be analyzed;

(4) Collection of wind direction, speed, and stability data; and

(5) Chain of custody control.

(b) The owner or operator with an air emission monitoring system installed to comply with requirements of §264.95(a) must:

(1) determine the concentrations of hazardous constituents and decomposition byproducts in ambient air samples in accordance with (b)(2) of this section.

(2) For each air upwind and downwind sampler site, obtain at least four upwind or downwind concentrations taken preferably on an equal interval over a three month period and determine the arithmetic mean and variance.

(c) The owner or operator with an air emission monitoring system to comply with the requirements of §264.95(c) must monitor two times per year with a portable or other equivalent detection device the concentration of the following or other suitable parameters, used as indicators to detect the location of migrated gaseous emissions:

(1) Total hydrocarbons; and

(2) Total halogenated compounds.

(d) The owner or operator with an air emission monitoring system implementing the requirements of §264.95(a) and (c) must determine the wind direction and speed, and other meteorological conditions any time air or air emissions are sampled, as necessary for the evaluations required in accordance with §264.97(a), (b), (c), and (f).

4. Air emission evaluation and response - §264.97

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11142-43

D. Regulatory Language

§264.97 Air emission evaluation and response.

(a) The owner or operator with an ambient air monitoring system installed to comply with the requirements of §264.95(a) must predict the anticipated concentration of hazardous constituents and decomposition byproducts in the ambient air at the downwind monitoring sampler sites taking into account the upwind concentration, initially and quarterly thereafter.

(b) Quarterly the owner or operator must compare the quality of ambient air samples obtained from the downwind air monitoring sites required in accordance with §264.95(a)(2) with the predicted quality in accordance with paragraph (a) of this section and include an analysis of the quarterly comparison with the annual report.

(c) Annually the owner or operator must repredict, based on data generated by the air monitoring program required in accordance with §264.90(d), the anticipated effect of the facility on ambient air quality. The anticipated effect must include at a minimum the worst condition, quarterly, and annual effects.

(d) As part of the annual report required under §264.75, the owner or operator must compare the anticipated effect of the facility on ambient air quality as repredicted in accordance with paragraph (c) of this section with the provisions of the facility permit.

(e) If the comparisons made under paragraph (d) of this section show non-compliance with permit provisions on ambient air quality, the owner or operator must:

(1) Determine whether the facility disposal practice must be modified to enable compliance with the requirements of the permit, and

(2) Include his findings and his proposed modifications to the facility disposal practice in the annual report required under §264.75.

(f) The owner or operator with an air emission monitoring system to comply with the requirements of §264.95(c) must have an approved plan for an air and area contamination assessment program. The plan must describe an air emission monitoring program capable of identifying the location of gaseous release migrated from the limit of the waste management area, and capable of assessing the effect on ambient air quality in the affected area.

(g) If monitoring performed to comply with the requirements of §264.96(c) shows a detection of gaseous release, the owner or operator must implement the plan for an air and area contamination assessment program which meets the requirements of paragraph (f) of this section.

(h) After implementation of the plan in accordance with paragraph (g) of this section, the owner or operator must compare the extent of migration and the assessment with the provisions of the facility permit and in accordance with the provisions of the plan, provide an analysis of this comparison in writing to the Regional Administrator.

5. Air emission recordkeeping and reporting - §264.98

A. Proposed Regulation and Rationale

N/A

B. Summary of Comments

N/A

C. Discussion

See the Preamble at 46 FR 11143

D. Regulatory Language

§264.98 Air emission recordkeeping and reporting.

(a) The owner or operator must keep records of all analyses and evaluations of ambient air quality, wind direction and speed, and air emissions required in accordance with this subpart.

(b) The owner or operator must report the following information to the Regional Administrator:

(1) The results of evaluations made in accordance with the requirements specified in §264.97(d), (e), and (h).

(2) Annually: the concentrations or values determined in accordance with §264.96(b), (c), and (d) along with the evaluations required under §264.97(b). During the active life of the facility, this information must be submitted as part of the annual report required under §264.75.